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ABSTRACT

The infusion of career-based education throughout the curriculum as academic and technical curricula are integrated across all subject areas and grade levels is substantially changing the delivery and focus of K-12 education despite the lack of evidence substantiating the effectiveness of the following school-to-work (STW) reform concepts: whole school reforms; work-based learning; career academies; and contextual learning. A perceived success of STW may not be attributable to career-focused education or integrated curricula. Rather, success may arise from concurrent implementation of other reforms. The following strategies, which can all be implemented without a career focus and absent contextual or work-based learning requirements, have shown evidence of being more likely to raise student achievement: (1) all students complete a challenging curriculum that includes college preparatory courses in English, mathematics, and science; (2) graduation requirements are increased; (3) all students complete either algebra or pre-algebra by the end of grade 8; (4) teachers set high expectations for all students through challenging lessons and rigorous assignments; (5) students are taught by teachers who are knowledgeable in their subject; (6) early and continual guidance and advisement concerning postsecondary options and choice of high school courses is provided; and (7) small learning environments, including smaller high schools and schools within schools, are created. (Contains 36 references.) (MN)

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Introduction

America's attempts to revitalize education have been steeped in controversy and have resulted in the initiation of multiple reform policies over several decades. Too often schools have tried to implement what is tantamount to the reform policy *du jour*, at times focused on targeted populations and specific programs, then just as quickly refocused on whole school reform. The result has been confusion and consternation across all aspects of public education, negatively affecting many stakeholders in the system.

Defining what educational content is necessary for all youth has become both vexing and contentious. The focus of American education has been debated throughout the past century. The debate on whether the focus of schooling is to be academic, vocational, or a mixture of the two, continues today. Faced with the stagnant and lackluster achievement of comprehensive schooling and a vocational education system that has too often been considered a warehouse for low-achieving students, the call for transforming all education has gained support from all levels of government. High standards, high-stake assessments, and greater relevance to the world of work are the central tenets of current reform.

Beginning with the Improving America's Schools Act of 1994 (P.L. 103-382) and Goals 2000 (P.L. 103-227), through the recently passed Leave No Child Behind Act of 2001 (P.L. 107-110), federal funding of elementary and secondary education programs require state assessments to be aligned to state content and performance standards as a condition of funding eligibility.

In addition to these standards and accountability reforms, two initiatives currently playing a major role in education reform activities are School-to-work (STW), or School-to-Careers (STC), and whole school reform. Both STW and whole school reform are driving much of the current curriculum redevelopment and education restructuring.

School to Work

As business and education leaders widely concurred that American students are inadequately prepared, not only for further education, but for successful careers, high schools in the early 1990's began to organize all or parts of their curricula around career training and preparation. The Carl D. Perkins Vocational and Applied Technology Education Act of 1990 spurred renewed interest and experimentation in this area. Four

years later, career focused education became the cornerstone of federal education reform policy.

Congress passed the School-to-Work Opportunities Act of 1994 (STWOA, P.L. 103–239) to address the failure of America's primary, secondary, and vocational education systems to produce graduates with marketable knowledge and skills. This legislation was designed to provide an umbrella philosophy for many activities that were intended to systematically restructure all education for all students. The STWOA centered education restructuring around school-based learning and work-based learning. Vocational education was no longer to be a stand alone program. All education at all levels would now take on attributes of career training and preparation.

Embodied in the STWOA are the central concepts of the School-to-Work philosophy – integration of academic and vocational education, workplace competencies, and explicit connection of learning with careers. Contextual, or applied learning, is the hallmark of this philosophy. Proponents of STW argue that students will attain higher levels of academic achievement when learning is placed within the context of the workplace. It is believed that education must be relevant to the real world, particularly the world of work, to foster in students a desire to achieve greater levels of learning. Proponents assert that integrating academic and vocational education in every discipline, across all subjects, at all grade levels, in all schools will produce higher achievement.

To varying degrees, the defining features of STW have been absorbed in other education reform efforts including state academic standards, Title I grants to local educational agencies, New American High Schools, Small Learning Communities and whole school reform models. Many of these activities encourage teaching and learning in the context of real-life applications and careers. The infusion of career based education throughout the curriculum as academic and technical curricula are integrated across all subject areas and grade levels is substantially changing the delivery and focus of K-12 education despite the lack of evidence substantiating the need for such dramatic reform.

Whole School Reform

Since the passage of Goals 2000, many major educational programs targeted to specific populations have been replaced by whole school reform measures. Designers of reform models recognized the capability of whole school reform to act as a vehicle to expand delivery of contextual learning and career focused education to more schools through federally funded programs. While whole school reform is not the only means by which education can be altered to deliver contextual or career focused education, STW proponents viewed it as an advantageous opportunity to combine STW principles with other reform practices in one model. STW concepts continue to be sustained through inclusion in whole school reform models despite the sunsetting of the STWOA. For example, the Comprehensive School Reform Demonstration Act (CSRD) provides

increased federal funding for whole school reform and specifically lists reform models that meet federal funding criteria, many which incorporate STW principles.

Many questions and concerns surround the effectiveness and necessity of both STW and whole school reform. Whole school reform models, even absent STW principles, are problematic in practice. The majority of whole school reform models, endorsed through federal legislation and funding, reflect the prevailing wisdom of modern educators, many of whose ideas are rooted in questionable pedagogical practices.

Historically, progressive education has rarely lived up to its promise. Its main features, student centered learning, teacher as facilitator, thematic learning, the project method, discovery learning, authentic assessments, and emphasis on developing higher order thinking skills have yet to prove effective in consistently raising academic achievement. Progressive methodologies have successfully impacted achievement levels in only a small number of schools – affluent schools attended by highly motivated students. Traditional schools have experienced greater success in raising student achievement, especially among children from disadvantaged backgrounds.

Beyond their ineffectiveness to impact achievement levels, whole school reform models are often expensive to implement and maintain. Teachers, whose time is limited, are typically overwhelmed by training, committee requirements, and curriculum development. Resource allocation and staffing needs over several years of implementation result in burdensome costs to districts. Furthermore, reform models are often implemented piecemeal due to many factors including conflict with existing district policies and teacher practices.

Some districts, dissatisfied with results, are totally abandoning whole school reform for a more traditional approach to education despite having made the major investments of time, money, and effort needed to implement whole school reform. A prominent example of a district discarding whole school reform is the Memphis City Schools. After six years and $12 million, Memphis City Schools abandoned whole school reform in June of 2001 due to stagnant or declining test scores on state tests in mathematics, reading, and English. Other districts nationwide are also abandoning whole school reform on a large scale, including San Antonio and Miami-Dade County.

These examples are important because it is seemingly assumed that there exists a core set of well proven, comprehensive whole school reform initiatives. That simply does not agree with observable data. The majority of whole school reform initiatives can not provide substantial evidence of effectiveness in improving student achievement. A 2001 RAND report notes that only about half of schools involved in a study of whole school reform made gains relative to their district. Incorporating STW principles into whole school reform does not make whole school reform any more effective. Neither does linking STW to whole school reform make STW any more effective.

Economic Considerations

STW has been a business driven education reform for the past two decades. Proponents perceive a growing lack of American skilled labor capable of meeting the demands of the 21st century workplace. Labor market inefficiencies are faulted for producing a mismatch of job openings and worker skill level. Guided by the influential Commission on the Skills of the American Workforce (CSAW) 1990 report, *America's Choice: high skills or low wages!*, business is ardently promoting education reform, steeped in STW principles, that entails integration of academic and technical education at all grade levels, work-based learning, national skill standards, and skill certification.

It is argued that the United States possesses "the worst school-to-work transition system of any advanced industrial country...Education is rarely connected to training and both are rarely connected to an effective job service function." (CSAW, 1990, p. 4). Proponents of STW contend that not everyone will or should go on to college, as census numbers indicate that the majority of jobs in America do not, and will not, require a college education. They point out that while only 20 percent of jobs in the future will require a four year degree or higher, our educational system has in the past been fixated on providing academic curricula aimed at college preparation for all students. The majority of future jobs are projected to be in the professional and technical degree professions requiring only two years of post-secondary work or apprenticeships.

It is also argued that American businesses are transitioning to high performance workplaces requiring high skills related to a flexible technologically based organization where decisions are forced down to empowered front line workers.

In light of these arguments, the current American system of education has come to be portrayed as inefficient, uneconomical, and out of date:

- Inefficient – Labor trends and needs are ignored in the education of students.
- Uneconomical – Public dollars are wasted by providing unnecessary education to those who are unlikely to need a college education. Moreover, U.S. labor markets are perceived as chaotic as well as uneconomical. Job shopping and searching is viewed as wasteful, while the marked churning and instability of the U.S. youth labor market is considered costly.
- Out of date – Business is transitioning to high performance work organizations requiring workers skilled in problem solving and decision making, skills which the current American education system is incapable of producing.

Therefore, according to STW proponents, American education must be restructured to provide a smooth transition from school to work and equip students with the skills directly applicable to their career interest. Education and economics must meld in order to ensure U.S. competitiveness worldwide.

This is a questionable course at best, for market realities do not support the underlying arguments of STW reform. First, STW initiatives, including work-based learning and the explicit connection of students to business, are heavily influenced by Northern European systems of education, in particular the German education and training model. However, such initiatives are based on speculation and questionable interpretations of existing evidence (Heckman, Roselius, Smith, 1994):

- There is no evidence that the German apprenticeship system is any more effective in promoting skill formation. (p. 84)
- Lower youth unemployment in Germany is a result of regulations that compel German youth to stay in school or participate in apprenticeship programs until age 18. (p. 84)
- German apprentices leave the firms that train them at very high rates and often take jobs in occupations different from those in which they are trained. (p. 84, 99)
- Wage growth rates for German apprentices are comparable to American youth. (p. 117)
- The assertion that German labor is more productive than U.S. labor is a myth. (p. 84)
- Proponents have failed to demonstrate that high performance workplaces actually increase productivity. (p. 85)
- Very few American businesses are participating in the new high performance workplace revolution. (p. 92)

Secondly, characterizing the U.S. youth labor market as uneconomical and wasteful denies the value of job searching and shopping. Job shopping permits youth to learn more about their own skills, aptitudes, interests, and suitability to careers while moving through a series of jobs. It is an activity that requires thought and effort, while promoting individual growth.

Thirdly, the perceived economic value of career and technical education is not substantiated. Research shows that education oriented to specific workplace skills and job training produces graduates who are less versatile and unable to change occupations without substantial retraining. By contrast, graduates of a rigorous academic education can readily learn new skills and adjust to new jobs. STW programs may have greater impact on securing entry-level positions at higher wages, but do not lend to improved future labor market outcomes. There is little positive evidence to date that STW programs positively impact adult labor market outcomes.

As American educators, business leaders, and policy makers look abroad for solutions, the education and training systems of Northern Europe are increasingly criticized for their narrow training that limits future individual growth and life options. Critics of STW have correctly warned of the limiting effects of education directly linked to perceived skill needs of a particular labor market at a certain point in time.

Finally, academic education does have economic value and translates to improved future labor market outcomes. It has been demonstrated that higher educational attainment is positively related to earnings. More years of schooling result in better jobs, higher earnings, and greater potential for occupational achievement. Although education in and of itself does not guarantee higher income, the benefits accrue with time. Academic education nurtures cognitive abilities essential to post-secondary education success and occupational advancement. For the non-college bound student, an academic education maintains the individual's options for future post-secondary education. On the job, academic skills provide opportunity for advancement and enhanced productivity in the workplace. Often upward mobility is dependent on educational attainment. A comprehensive academic education opens doors to opportunities far in the future, including avenues not considered at a younger age.

Though education has always had economic implications, there are other benefits implicit to an academic education beyond securing gainful employment or occupational advancement. Knowledge of history, science, mathematics, and literature is valuable regardless of whether it leads directly to a job. Academic education exposes students to the great thoughts and ideas of every age and discipline which enlightens minds, and civilizes mankind. It is considered to be the type of education that is necessary for a person to be free.

Businessmen, as well as college professors, regularly point to the lack of academic skills in today's high school graduates.

- According to a 1998 report by the National Association of Manufacturers (Carnevale, 1998), "40 percent of all 17-year-olds do not have the necessary math skills—and more than 60 percent do not have the necessary reading skills—to work in a $33,000 per annum production job at a modern auto plant." (p. 17)

- More recently, the American Management Association reported that 38.3 percent of job applicants tested in 1999 lacked sufficient skills for the positions they sought. (p. 1)

- Both the 1998 and 2001 Public Agenda polls of employers and professors revealed that the greatest dissatisfaction with recent high school graduates' skill levels lies in basic academic knowledge and skills – math, writing, spelling and grammar.

- A 1997 Investor's Business Daily poll queried business leaders from the top ten percent of publicly-traded U.S. companies on the skill set they favored in applicants; 79.2% stated general skills (reasoning, analytical, broad knowledge) while only 17% stated specific skills (task-specific skills such as computer programming).

Curiously, education reformers have responded to this academic skills shortfall by redefining the issue as a lack of workplace skills. Disguising academic deficits as work skills deficits cheats students and society alike. The fact that many job applicants lack the literacy and math skills necessary to perform anything but rudimentary job assignments is not the result of the schools' failure to teach workplace skills; rather, it is the result of their failure to teach literacy skills and essential academic knowledge.

The Hudson Institute's landmark report on workforce development, *Workforce 2020: Work & Workers in the 21st Century*, correctly relates:

> If America could increase the number of traditional high school graduates with the appropriate reading, writing, math, reasoning, and computer skills, it could go a long way toward filling available jobs and laying a suitable foundation on which workers could upgrade their skills once in the workforce. (p. 134)

Reform Impact: School to Work

Due to STW's major impact on the current delivery and focus of K-12 education, serious consideration must be given to its effectiveness and impact on academic achievement. If the principles of STW are to be applied to all students and its defining features applied in current education reform nationwide, contextual learning, career majors, and work-based learning must be capable of raising academic achievement apart from conveying occupational competencies and skills. If it does not, then this reform is merely advancing the academic mediocrity of the current vocational system throughout all public education. Transforming all education to vocational education is surely not the desired goal. All students, including vocational and technical, must be challenged by higher academic standards.

Early STW research was mainly focused on the implementation and process of reform. But a high degree of completion of the reform implementation cannot be employed as a proxy for the actual results of the program. However, more recent studies are assessing the impact of STW on student engagement as well as academic achievement. Many studies do conclude that STW programs support youth development and career preparation; that employers are enthusiastic about STW; that teachers see value in STW; and that STW improves attendance, grades, and graduation rates (Hughes, Bailey, Mechur, 2001).

However, there is very little evidence that student participation in STW improves learning. To date STW has not proven to increase the academic achievement of students as measured by standardized test scores.

- A study of 100 students participating in the Cornell Youth Apprenticeship Demonstration Project found that the youths did gain job-related skills and knowledge, but there were no effects on academic achievement (Hamilton & Hamilton, 1997).

- A random-assignment study found that participation in a career academy had no effect, either positive or negative, on standardized test scores (Kemple, Snipes, 2000).

- A report produced by the Institute on Education and the Economy concluded that "research regarding STW students' achievement on standardized tests is inconclusive. The few existing studies indicate that there is little, if any, effect on test scores." (Hughes, et. al., 2001).

These studies reaffirm the conclusion reached in a 1996 U.S. Department of Education study that, while "[m]ost [STW] programs are reported to be effectively teaching occupational skills at a sufficient level...less commonly, gains in academic skills are reported." (U.S. Department of Education, 1996, p. 40).

According to the largest study of STW conducted to date, Mathematica Policy Research's National Evaluation of School-to-Work Implementation, many schools experience a tension between the priority to raise academic standards and the interests of STW implementation (Hershey, Silverberg, Haimson, 1999):

- It has been difficult in evaluation site visits to identify clear plans for promoting [academic] skills in workplace activities that STW partnerships have arranged. (p. 141).

- Efforts by states to raise academic standards are occurring independently of STW. (p. 141).

- In some cases, [STW] activities can occur only in ways that intrude on academic class time. Even when they are part of special courses, they consume time that students could otherwise devote to elective academic courses. (p. 142-143).

- Despite the theory that STW-type activities can contribute to academic attainment, the absence of rigorous evidence applicable to their own schools often leaves frontline staff feeling caught between the pressures of competing priorities. Moreover, when academic teachers embrace [STW] ideas about making learning more applied and contextual, their early efforts sometimes appear to retreat from high standards. (p. 142-143).

- Teachers are often concerned that incorporating more practical and hands-on learning will detract from the more traditionally defined academic skills they consider critical to their students' success in standardized testing, college admissions, and more advanced study. (p. 73).

- Students often face a trade-off between taking the time to pursue electives with career content and using their elective options to take more advanced traditional academic classes. (p. 144).

Reform Impact: Work-Based Learning

Questions surround another fundamental component of STW – work-based learning. As a result of STW, and in particular the STWOA, the number of high schools offering work-based learning experiences such as internships, school-based enterprises, cooperative education, and other programs that directly link school and work has increased nationwide. It is assumed that student learning is reinforced through both the application of academic knowledge in the workplace and workplace activities reinforcing school-based knowledge.

However, work-based learning has not been proven to reinforce academic learning. Research evidence provides no strong support for the academic reinforcement claim.

- More often than not interns' tasks were productive for the work of the office or site. (Hughes, et. al., p. 32).

- Except for students who were taking courses in clerical skills and data entry in school, the academic reinforcement functions were minimal. Thus, in general, the work of the internships was functional to the organization, as would be expected, but hardly academic. (Hughes, et. al., p. 32).

- Students who participated in structured work-based learning worked more hours than students who just had jobs, were less likely to take a mathematics and science course during their senior year, and had lower achievement than students who just had jobs. (Bottoms, Presson, 1997).

- The richer learning experiences of school-sponsored, work-based learning do not offset the loss of learning that occurs when students leave school early and fail to take high-level mathematics and science courses in their senior year. Data from the 1996 *HSTW* Assessment offer little evidence that work-based learning experiences are an acceptable substitute for chemistry, Algebra II and demanding language arts courses. (Bottoms, Presson, 1997).

Other studies conducted by the National Center for Research in Vocational Education (Stasz, Kaganoff, 1997) and Mathematica Policy Research, Inc. (Haimson, Bellotti, 2001) also point out the lack of rigor and academic application in work-based learning experiences.

- Students are rarely assigned challenging tasks unless they receive substantial amounts of training. (Haimson, Bellotti, 2001, p.19).

- Even when internships are connected to the school curriculum, many opportunities to practice or reinforce academic skills are not provided. (Haimson, Bellotti, 2001, p.38).

- Student tasks tend to be primarily clerical, requiring little creativity. (Stasz, Kaganoff, 1997, p. vi).

- Problem solving skills centered around procedural aspects of work not substantive, technical matters. (Stasz, Kaganoff, 1997, p. vii).

David Stern of the National Center for Research in Vocational Education observes that most evidence claiming improved academic achievement through work-based learning is anecdotal – interviews and surveys of participating students and employers. He comments that:

> All of these studies, however, rely on reports by participants themselves about what they are learning. Objective measures, and comparisons with non-participants, are lacking. We cannot tell whether the positive reports indicate a true effect of [work-based learning], as opposed to the effect of recruiting participants who are enthusiastic about [work-based learning] to begin with, or the Hawthorne effect of participating in something innovative that attracts attention. (Stern, 1997).

"[W]ork-based learning proponents who stand on the reinforcement claim as a way to convince skeptics of the program's value are standing on thin ice." (Hughes, Moore, Bailey, 1999, p.36).

Reform Impact: Career Academies

Career Academies are growing rapidly across the nation due to the impetus of STWOA. Over 1,500 high schools have implemented the approach as a response to the many problems they face. Established over 30 years ago, the Career Academy initiative was originally designed as a vocational training program targeted at students considered to be at high risk of dropping out of school. Over the past decade the primary goals and target populations of many Career Academies have changed. Today it is widely accepted that the Career Academy initiative should no longer be distinctly vocational but should seek to prepare a broad range of students, from high-performing

to high-risk students, for both work and college. It is specifically identified as a "preferred approach" by the STWOA. Only recently has research attempted to determine the relative effectiveness of Career Academies on the educational outcomes for the broad cross-section of students it seeks to serve.

Manpower Demonstration Research Corporation's (MDRC) Career Academies Evaluation (Kemple, Snipes, 2000) provides new evidence on engagement, performance, and initial transitions to post-secondary education and employment for Career Academy students. Their findings reveal Career Academies:

- Increase the level of interpersonal support students experience. (p. ES-2).
- Increase participation in career awareness and work-based learning activities. (p. ES-2).
- Reduce dropout rates, improve attendance, increase academic course-taking, and increase the likelihood of earning enough credits to graduate on time for students at high risk of dropping out. (p. ES-2).
- Had little or no impact on most indicators of students' engagement and performance for low risk sub-groups. (p. 44).
- On average produced little or no change in outcomes for medium-risk subgroups. (p. 44).
- Do not improve standardized math and reading achievement test scores. (p. ES-3).
- When the findings are averaged across diverse groups of students in the full study sample, it appears that the Career Academies produced only slight reductions in dropout rates and modest increases in other measures of school engagement. These aggregated findings, however, mask the high degree of variation in effectiveness among different groups of students and across different program contexts. (p. ES-3).
- When data are averaged across the diverse groups of students and sites participating in the evaluation, it appears the Career Academies produced only modest improvements in students' engagement and performance during high school. (p. 44).

MDRC does stress the importance of recognizing that Career Academies affect groups of students differently depending on the background characteristics students bring with them into the program (Kemple, Snipes, 2000, p. 43).

The most recent MDRC evaluation (Kemple, 2001), released December of 2001, gives further insights into the effectiveness and impact of a Career Academy's career-focused education. Career Academies:

- Had little influence on course content and classroom instructional practices.
- Left standardized test scores unchanged.
- Relative to similar students nationally, both the Academy and non-Academy groups had high rates of high school graduation, college enrollment, and employment.
- Had little or no impact on high school graduation rates and initial post-secondary education and employment outcomes. The Academy group's relatively high outcome levels were matched by those of the non-Academy group. This was true for subgroups of students at high, medium, and low dropout risk.

STW's inability to impact standardized test scores is a serious concern. Widely considered an effective measure of student learning, standardized tests are envisioned to play a greater role due to the standards and accountability requirements of the No Child Left Behind Act of 2001. In an era of high-stakes testing, STW may be viewed as more of an impediment to student and school academic success.

Contextual Learning

The underlying learning theory on which STW initiatives rest is contextual or applied learning. The integration of academic and vocational curricula is said to be necessary in order to connect the work students do in school to the demands of the 21st century workplace. The assumption that this type of active learning will raise student achievement while providing the economically necessary skills sought after by employers is more theoretical than empirically based.

The most common form of integration is the infusion of work tasks and examples into academic courses – making academic courses more applied. Despite its wide appeal, relatively little evidence exists that supports contextual learning and curricula integration's actual ability to improve student achievement. A review of several studies of applied academics by Stern, Kaganoff, and Eden (1994) found:

- Little hard evidence that participation in an integrated program affects student learning. (p. 42).
- Nearly every study had serious methodological or conceptual flaws that cast doubt on reported findings. (p. 42).

- No study could link integrated program participation to economic competitiveness. (p. 41).

Lauren Resnick of the University of Pittsburgh, a leading theorist and proponent of constructivist and contextual learning, notes that, "Despite broad interest in contextualized learning programs, there is little systematic evidence about their effectiveness, especially with respect to meeting academic standards in math, science, and English/communications." (Resnick, Jury, 2000).

Some of the foremost cognitive psychologists in the United States, John Anderson, Lynn Reder, and Herbert Simon of Carnegie Mellon University, are among those whose work refutes current education policy. They conclude that both constructivist education theory and contextual learning claims are unproven and, in several respects, at odds with well-known scientific findings. In fact, such methods may be detrimental to learning as knowledge becomes situation-bound and context-specific, leaving the student unable to generalize and transfer his knowledge to new and different situations.

Youth who learn contextually do not perform well when basic knowledge and theoretical thought are required. What is known of contextual learning demonstrates it is likely to be highly variable and uncertain. It does not instill knowledge and skill effectively, securely, or universally. What students remember remains uncontrolled, contingent, and largely irrelevant to definite and responsible learning goals (Hirsch, 1996, p. 218).

Contrary to the more commonly implemented contextual/applied learning integration, findings do suggest that making vocational courses more academic improves student academic achievement. Vocational students who completed a challenging curriculum comparable to college-preparatory courses, including English, mathematics and science, obtained higher achievement test scores (Rock & Pollack, 1995; Bottoms, Fox, New; Bottoms).

In spite of weak results, STW maintains prominence because federal policy has too long relied on accepted educational research and theory that has conformed to the constructivist and contextual philosophy. Too often education research is dominated by ideological conformity and anti-empiricism. A body of scientific research exists that counters current dogma, but is seldom acknowledged, let alone applied in the education community. It is time to open the forum for discussion so that all evidence and empirical research can contribute to formulating sound education policy and practice.

Reform Impact: What Works

To determine what, if any, STW education reform concepts produce positive results, it is necessary to sift through the many elements. Often concurrent reforms are implemented in conjunction with career-focused education. A perceived success of STW may not be attributable to career-focused education or integrated curricula.

Rather, success may arise from the concurrent implementation of other reforms. Strategies that have shown evidence of being more likely to raise student achievement are as follows:

- All students complete a challenging curriculum that includes college preparatory courses in English, mathematics, and science.
- Increased graduation requirements.
- All students complete either algebra or pre-algebra by the end of eighth grade.
- Teachers set high expectations for all students through challenging lessons and rigorous assignments.
- Students are taught by teachers who are knowledgeable in their subject.
- Early and continual guidance and advisement concerning post-secondary options and choice of high school courses.
- Creation of small learning environments, including smaller high schools and schools within a school.

All of the above strategies can be implemented without a career focus and absent contextual or work-based learning requirements. Optional career-focused and work-based learning programs must be offered to provide flexibility and alternative education paths for those students who voluntarily choose such.

Aside from providing opportunities for students to gain occupational skills and work related attitudes, the strongest argument for many STW initiatives is higher student motivation and engagement. Though early studies point to higher completion rates for graduation requirements and lower dropout rates, these findings were not substantiated by the latest MDRC study. Evidence does suggest, however, that many STW programs have a positive impact on keeping high risk students in school by providing an alternative option that engages and motivates them to complete their education.

These outcomes cannot be dismissed. Increasing the likelihood that high risk students remain in school and graduate is significant when considering the societal and economic penalties faced by high school dropouts.

However, caution must be taken in assessing these findings, for at this time only students who elect to participate in STW programs are enrolled. This self-selecting process likely skews the resulting program outcomes. Students who take the initiative to enroll are pre-motivated and it is this motivation that may account for these positive effects. An initiative that benefits self-selected students does not necessarily benefit all

students. Career and technical education must not be the focal point of all high school education. Rather, it must be one of many options open to all students. The current dramatic move to restructure high schools around a series of career fields is accelerating and unwarranted.

Many districts and schools, including Minneapolis; Boston; Chicago; Denver; Houston; Prince George's County, MD; Lancaster County, PA, and others have moved in this direction. The Minneapolis school district provides an pertinent example of restructuring the high school curriculum wholly around specific career areas. Students' career choice requires approval based on teacher recommendations, test scores or grade point averages, and writing samples as condition of acceptance. The approved career area will determine the classes each student will take as well as the school they will attend. Changes of a student's career choice requires process and approval and is not guaranteed. If approval is given, the student may need to transfer to a new school and begin again earning credits towards the new career interest.

These dramatic changes are unwarranted. Unsupported by research and unsuccessful in meeting all students' needs, reformers have merely exchanged one "one size fits all" approach for another. There is a built in systemic rigidity that restricts the student who has a change of mind concerning their chosen career (which is a likely scenario for a teenager). Further, research findings on enrollment and attrition rates for Career Academies from recent MDRC studies do not support the current expansion of career-focused education. Students voluntarily chose to participate in the Career Academies, yet less than 60 percent of the students remained in the programs throughout high school. Many leave due to loss of interest in the occupational area. The demand for career focused education may not be at the level proponents project. More importantly, research findings highlight the importance of individual choice. Parents and students must be afforded the opportunity to freely pursue the educational options that best suit their needs and interests. If the "one size fits all" academic education is not adequate for all students, neither is the "one size fits all" career-focused education.

Requiring all students to be immersed in career-focused education blindly ignores the fundamental right of individual choice and the realities of adolescence. Ninth and tenth grade students should not be required to concentrate their education on one career interest. Any degree of specialization in the curriculum narrows the focus of education and limits individual flexibility and opportunity for the future. Career focus and decision choices should remain open as long as possible. All students must be given a solid academic grounding (preferably college preparatory) that is essential for keeping open many life choices and options. Driving career focused education into ever younger grades exacerbates the problems already noted. Most students are simply not prepared to make such weighty life decisions at the beginning of high school, much less in junior high or even elementary school.

Students can be better prepared for life choices through informed and thoughtful counseling. The need for quality guidance and career awareness to help guide students through the expected times of youthful indecisiveness cannot be overstated. Sadly, studies suggest that few students receive adequate guidance counseling, particularly urban students who are especially in need of support.

Providing students and parents with early and continued assistance in setting goals and encouragement to complete challenging academic courses leads to higher achievement and post-secondary enrollment. Too often students do not even know they lack the necessary academic skills and knowledge needed to meet their personal goals. Over three-fourths of urban career and technical students desire to continue their education after high school, but few are prepared to succeed in college, and fewer still realize it.

Guidance must begin earnestly in the middle school years so that all students are apprised of the critical necessity to complete core academic courses through the junior and senior years. The use of career fairs, field trips, skills and interest inventories, and elective career interest courses provides exposure to the world of work, allowing all students to gain valuable information regarding future options. Career awareness is distinct from career focused education and does not include work-based learning, internships, and job shadowing although these types of programs should be available to all students who have a desire to participate. No student should be required to center courses around a particular career focus.

Policy Implications

Educational reform should not be about the integration of technical and academic education for the purpose of ensuring high school graduates possess occupational skills relevant to certain careers. Rather, reform should be about improving academic requirements for all students, college and non-college bound, to ensure that their future life options are not constrained. A continued emphasis on high academic standards with challenging coursework in core academic subject areas must be required of all students.

Though it is difficult to mandate reform through legislation as local capacity and will cannot be controlled from the federal or state level, federal policy should strongly encourage the following:

- Policymakers must be cautioned against "one size fits all" legislation. Educational initiatives that are smaller in scope can yield great gains in achievement. It is not necessary to package various initiatives into one model to produce results. The emphasis on whole school reform in federal policy is costly and meeting with growing resistance. More emphasis must be given to encouraging educational initiatives smaller in scope, more affordable, and proven to positively impact student achievement. In so doing, local districts and schools

will find the flexibility needed to implement policy that is applicable to conditions existing in individual schools and is best suited to their unique student needs.

- Halt funding of education reforms that utilize contextual learning for all students and all subjects. Define core academic courses as free of contextual and applied learning elements. Federal policy must prevent the infusion of workplace competencies in academic subjects, particularly in elementary and middle school curriculum.

- Utilize federal funding not just for failing schools, but for failing students. Provide funding grants directly to parents and students for remedial and tutorial services through both public and private providers.

- Encourage locally developed accelerated learning schedules aimed at bringing failing students up to grade level.

- Teacher quality must be improved to support higher academic expectations. Teacher preparation and development that requires teachers be qualified in their subject area and promotes higher expectations for all students must be supported. Initiate funding for teacher development to improve content knowledge and performance so to better support students in meeting higher standards. Vocational teacher preparation should include training on how to incorporate academic skills into vocational courses.

- Teacher development must incorporate higher expectations for all students, particularly for career and technical education students. Funding for training in the design of more challenging assignments and incorporation of more literacy skills in technical education is required.

- Alternative certification routes that bypass teacher education and training programs will open the door to a vast pool of potential applicants from the professional and retired ranks, as well as liberal arts majors. Compressed classroom management training and mentoring controlled at the district level is but one way to provide alternative teacher training to applicants already qualified in the subject matter.

- Technical and career education must not ignore the elementary and middle school years. Promotion of proven reading and mathematics instruction in the elementary grades will ensure that students are prepared when entering ninth grade to do high school work. The lack of basic reading and math literacy skills often results in student failure and lack of engagement in the high school years. Federal policy initiatives that encourage and demand stronger academic requirements during the middle school years will have enormous impact on the success of all students to meet post-secondary and occupational goals. Requirements can include: all students complete pre-Algebra or Algebra I by the

end of eighth grade and increasing the number of students who complete honors English or a comparable English course.

- Policy promoting increased core academic requirements for graduation for all students will not only improve post high school opportunities, but better prepare students for high-stakes tests and improve achievement levels for all sub-groups nationwide.

- Policy promotion of improved guidance and career awareness beginning in the middle school years and continuing throughout high school and focusing on academic requirements must occur. Funding for guidance staff development and resources for effective awareness programs must be a priority.

- Federal policy must encourage and fund initiatives that provide options for all students at multiple stages of their high school careers – including job shadowing, internships, apprenticeships, and work-based learning. A vibrant, voluntary vocational education should allow free movement in and out of career and technical education with no penalty. Such a system will attract both career and college-bound students while complementing, not supplanting, academic education.

- Implement federal tax credit legislation to encourage corporations and individuals to contribute to education initiatives that have been shown to be effective.

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